TP700
.A5

# INDEX

—TO—

# VOLUME LIV.

January 1 to June 30, 1891.


## A

Account Form in Use at Providence, R. I..... 928
Account Form in Use at Sedalia, Mo..... 929
Acids, Test Paper for..... 49
Address, President Paterson's Inaugural, Manchester Association..... 402
*Aldeny's Gas Analysis Apparatus..... 219
Alternating Current Phenomena..... 925
Aluminum Alloys, New..... 225
Ambrose, C. W., Use of Asphaltum in Building Sea Walls, by. 924
Ammonia Plant, New, for the Coltness Iron Works..... 672
Amount of Natural Gas Used in Iron, Glass and Brick Manufacture..... 81
Annual Meeting, Seventh, Ohio Gas Light Association. Revised Report.....435, 470, 522
Annual Meeting Southwestern Association. Official Notice.. 109, 145, 147, 181, 217
Annual Meeting Southwestern Gas Association. Official Report.....558, 594
Annual Meeting, Twenty-first, New England Association Gas Engineers. Revised Report.....260, 291, 328, 363, 399
Annual Meeting Western Gas Association. Official Notice... 521, 557, 593, 629, 665, 701
Annual Meeting, Fourteenth, Western Gas Association, Official Report.....738, 774, 811, 847, 882
Annual Report, Sixth, of Massachusetts State Gas and Electric Commissioners..... 110
*Apparatus for Heating Substances in Glass Tubes Under Pressure, by H. Pemberton, Jr..... 710
Apparatus, Ramsdell's, for the Manufacture of Wood and Oil Gas..... 10
Arc Lights, Candle Power of..... 110
Armstrong, Dr. T. N., Copying Book Illustrations and Other Similar Subjects by Means of Artificial Light, by..... 745
Artificial Production of Indigo..... 83
Asphaltum, Use of, in Building Sea Walls, by C. W. Ambrose. 924
*Atkinson Cycle Gas Engine..... 818

## B

Bailey's, Mr., Eccentric Comment..... 37
Baily, Mr. F., Electric Lighting Progress in London.....5, 45
Barratt, William, Some Thoughts on Gas Meters..... 743
Bate, Mr. Joseph M., Resignation of..... 121
Bates, Mr. T. A., An Experience in Purification..... 600
Baxter, Dr., Gets a Verdict..... 157
Beare, Mr. T. H., Cement Tests, by..... 8
Beatty, Robert H., Death of..... 47
Beckton, Some Notes on Carbureted Water Gas at, by T. Goulden..... 851
Bemis, Prof., On Gas Supply of Nashville, Tenn..... 881
Berlin Iron Bridge Company's Contracts.....11, 119, 155
Boies, Joseph M., Death of..... 674
Boston Board of Aldermen and the Local Gas Companies..... 11
Boston Smelling Committee..... 362
Briquettes..... 635
"British Medical Journal," Chemistry of..... 153

## C

California Coal Supply..... 229
Canada, Report of Inspector of Gas..... 397
Candle Power of Arc Lights..... 110
Candle Power of Arc Lights, Tested at Warren, Pa..... 156
Candle Power of Electric Lights..... 670
Candle Power Manchester (N. H.) Gas..... 121
Carbonic Acid Gas, Utilization of Waste..... 746
Carbureted Water Gas, by A. G. Glasgow..... 853
Carbureted Water Gas at Beckton, by T. Goulden..... 851
Cast Iron Pipe..... 673
Cast Iron vs. Steel Columns..... 534
Cement Tests, by T. H. Beare..... 8
*Chapman Washing Bottle, by J. H. Wainwright..... 710
Chemical Studies for Gas Engineers, by Norton H. Humphrys.....39, 75, 147, 183
Chicago, Annual Meeting.....74, 119
Chicago Company, Changes in Management..... 120
Chicago International Exhibition of 1893, by Mr. James Dredge.....223, 257, 295
Clinton Company, Electric Station of..... 85
Coal Industry, Some Census Figures on..... 297
*Coal or Coke, Simple Method for Analysis of..... 887
Coal Strikes and Petroleum Outlook, by James L. Hallett.... 846
Coal Supply, California's..... 229
Coltness Iron Works, New Ammonia Plant for..... 672
Columbia College, Course of Lectures on Electricity..... 11
Commercial Rating for Electric Generators, Thos. G. Grier... 187
Compressed Air for the Transmission of Power in Paris..... 186
Concrete in France and Italy..... 782
Connecticut Towns, Gas Charters for, by Burdette Loomis.... 119
Constructing Electrical Engineer, Observations of a..... 9
Cook, Prof. C. S., Present Theories Concerning the Nature of Electricity.....888, 921
Copying Book Illustrations and Other Similar Subjects by Means of Artificial Light, by Dr. T. N. Armstrong..... 745
Correction of "An Experience in Purification"..... 674

CORRESPONDENCE—

The Key City Gas Company's Contract with Mr. Graves.. 2
Special Editorial Correspondence, Ohio Association..... 397
Automatic Gas Governor..... 677
The Western's Outing at Louisville..... 737
St. Louis Methods..... 893
Correspondence, Special English....153, 298, 442, 602, 782, 923
Crocker, Prof. F. B., Electrical Units of the Present and Future.....80, 112

## D

Direct Production of Light..... 299
Distribution of Electrical Energy..... 637
Down, William H., Obituary..... 253
Dredge, James, Chicago International Exhibition of 1893... 223, 257, 295

## E

Easy Method of Finding Units of Heat of Combustion of Gaseous Mixtures, by Edward C. Jones..... 333
Effects of Temperature on the Limits of Explosions of Combustible Gas Mixtures..... 601
Egner, Mr., Resigns His Position..... 773
Electric Arc, The..... 406
Electric Generators, Commercial Rating of, by Thos. G. Grier. 187
Electric Lamps, Patched..... 893
Electric Lighting Progress in London, by Mr. F. Bailey.....5, 45
Electric Station of the Clinton (Mass.) Company..... 85
Electrical Energy, Distribution of..... 637
Electrical Engineer, Observations of a Constructing.....
Electrical Units of the Present and Future, by Prof. F. B. Crocker.....80, 112
Electricity and Gas..... 154
Electricity, Hydrogen and Oxygen Produced by..... 495
Electricity, Present Theories Concerning the Nature of, by Prof. C. S. Cook.....888, 921
Enfield, William, Presidential Address Southwestern Gas Association..... 148
Enfield, William, Gas as a Source of Light, Heat and Power.. 151
English Correspondence, Special.....153, 298, 442, 602, 782, 923
Equity Company, Brooklyn, to Go Ahead..... 157
Estimating the Value of Purifying Materials..... 299
Experience in Purification, An, by Mr. T. A. Bates..... 600
Experience in Purification, Correction..... 674

EDITORIALS—

The Old Year and the New..... 1
Mr. Bailey's Eccentric Comment..... 37
Annual Meeting of the Southwestern Gas Association.... 73
Obituary—William Mooney..... 146
Annual Meeting, New England Association..... 182
This Week at Boston..... 218
The Meeting of the Ohio Association..... 219
What Level Management Will Achieve..... 219
Obituary—William H. Down..... 253
President Prichard's Address..... 290
Mr. Lamson's Estimate of the Value of Note-Books..... 326
The Situation at Rochester..... 397
Afterthoughts Tracing to the Zanesville Meeting..... 433
Gas Works Residuals..... 469
Gas Commissioners and Their Powers..... 469
The Louisville Meeting..... 521
The World's Fair and the Gas Interest..... 521
Society of Gas Lighting..... 521
The Fuel Gas Scheme at Milwaukee..... 557
The Columbia Land Company..... 557
Secretary Littleton's Second Notice..... 593
Annual Meeting, American Meter Company..... 593
Director Windrim and the Stokers of the Ninth Ward Works..... 593
Rumor and Fact vs. the Western Gas Association..... 666
Cleveland City Council Demonstrates its Incapacity..... 702
Decision in the Chelsea Case..... 702
Mr. Egner Resigns His Position..... 773
The Louisville Meeting..... 773
The Blundering at St. Louis..... 809
Report of the World's Fair Committee, Western Association..... 809
Professor Bemis on the Gas Supply of Nashville, Tenn.... 881

## F

*Fenny's Patent Pipe-Cutting Machine..... 185
Few Notes on Carbureted Water Gas at Beckton, by T. Goulden..... 857
Fire Resisting Construction..... 151
Foote, Allan R., Municipal Ownership of Industries..... 40
Foote, A. R., Municipal Ownership of Quasi-Public Works. 668, 707
Foundations for Heavy Buildings..... 188
Fourth Annual Meeting Southwestern Gas Association. Official Report.....558, 594
Fourteenth Annual Meeting Western Gas Association. Official Report.....738, 774, 811, 847, 882

TP700
.A5

# INDEX

—TO—

# VOLUME LIV.

January 1 to June 30, 1891.


## A

Account Form in Use at Providence, R. I..... 928
Account Form in Use at Sedalia, Mo..... 929
Acids, Test Paper for..... 49
Address, President Paterson's Inaugural, Manchester Association..... 402
*Aldeny's Gas Analysis Apparatus..... 219
Alternating Current Phenomena..... 925
Aluminum Alloys, New..... 225
Ambrose, C. W., Use of Asphaltum in Building Sea Walls, by. 924
Ammonia Plant, New, for the Coltness Iron Works..... 672
Amount of Natural Gas Used in Iron, Glass and Brick Manufacture..... 81
Annual Meeting, Seventh, Ohio Gas Light Association. Revised Report.....435, 470, 522
Annual Meeting Southwestern Association. Official Notice.. 109, 145, 147, 181, 217
Annual Meeting Southwestern Gas Association. Official Report.....558, 594
Annual Meeting, Twenty-first, New England Association Gas Engineers. Revised Report.....260, 291, 328, 363, 399
Annual Meeting Western Gas Association. Official Notice... 521, 557, 593, 629, 665, 701
Annual Meeting, Fourteenth, Western Gas Association, Official Report.....738, 774, 811, 847, 882
Annual Report, Sixth, of Massachusetts State Gas and Electric Commissioners..... 110
*Apparatus for Heating Substances in Glass Tubes Under Pressure, by H. Pemberton, Jr..... 710
Apparatus, Ramsdell's, for the Manufacture of Wood and Oil Gas..... 10
Arc Lights, Candle Power of..... 110
Armstrong, Dr. T. N., Copying Book Illustrations and Other Similar Subjects by Means of Artificial Light, by..... 745
Artificial Production of Indigo..... 83
Asphaltum, Use of, in Building Sea Walls, by C. W. Ambrose. 924
*Atkinson Cycle Gas Engine..... 818

## B

Bailey's, Mr., Eccentric Comment..... 37
Baily, Mr. F., Electric Lighting Progress in London.....5, 45
Barratt, William, Some Thoughts on Gas Meters..... 743
Bate, Mr. Joseph M., Resignation of..... 121
Bates, Mr. T. A., An Experience in Purification..... 600
Baxter, Dr., Gets a Verdict..... 157
Beare, Mr. T. H., Cement Tests, by..... 8
Beatty, Robert H., Death of..... 47
Beckton, Some Notes on Carbureted Water Gas at, by T. Goulden..... 851
Bemis, Prof., On Gas Supply of Nashville, Tenn..... 881
Berlin Iron Bridge Company's Contracts.....11, 119, 155
Boies, Joseph M., Death of..... 674
Boston Board of Aldermen and the Local Gas Companies..... 11
Boston Smelling Committee..... 362
Briquettes..... 635
"British Medical Journal," Chemistry of..... 153

## C

California Coal Supply..... 229
Canada, Report of Inspector of Gas..... 397
Candle Power of Arc Lights..... 110
Candle Power of Arc Lights, Tested at Warren, Pa..... 156
Candle Power of Electric Lights..... 670
Candle Power Manchester (N. H.) Gas..... 121
Carbonic Acid Gas, Utilization of Waste..... 746
Carbureted Water Gas, by A. G. Glasgow..... 853
Carbureted Water Gas at Beckton, by T. Goulden..... 851
Cast Iron Pipe..... 673
Cast Iron vs. Steel Columns..... 534
Cement Tests, by T. H. Beare..... 8
*Chapman Washing Bottle, by J. H. Wainwright..... 710
Chemical Studies for Gas Engineers, by Norton H. Humphrys.....39, 75, 147, 183
Chicago, Annual Meeting.....74, 119
Chicago Company, Changes in Management..... 120
Chicago International Exhibition of 1893, by Mr. James Dredge.....223, 257, 295
Clinton Company, Electric Station of..... 85
Coal Industry, Some Census Figures on..... 297
*Coal or Coke, Simple Method for Analysis of..... 887
Coal Strikes and Petroleum Outlook, by James L. Hallett.... 846
Coal Supply, California's..... 229
Coltness Iron Works, New Ammonia Plant for..... 672
Columbia College, Course of Lectures on Electricity..... 11
Commercial Rating for Electric Generators, Thos. G. Grier... 187
Compressed Air for the Transmission of Power in Paris..... 186
Concrete in France and Italy..... 782
Connecticut Towns, Gas Charters for, by Burdette Loomis.... 119
Constructing Electrical Engineer, Observations of a..... 9
Cook, Prof. C. S., Present Theories Concerning the Nature of Electricity.....888, 921
Copying Book Illustrations and Other Similar Subjects by Means of Artificial Light, by Dr. T. N. Armstrong..... 745
Correction of "An Experience in Purification"..... 674

CORRESPONDENCE—

The Key City Gas Company's Contract with Mr. Graves.. 2
Special Editorial Correspondence, Ohio Association..... 397
Automatic Gas Governor..... 677
The Western's Outing at Louisville..... 737
St. Louis Methods..... 893
Correspondence, Special English....153, 298, 442, 602, 782, 923
Crocker, Prof. F. B., Electrical Units of the Present and Future.....80, 112

## D

Direct Production of Light..... 299
Distribution of Electrical Energy..... 637
Down, William H., Obituary..... 253
Dredge, James, Chicago International Exhibition of 1893... 223, 257, 295

## E

Easy Method of Finding Units of Heat of Combustion of Gaseous Mixtures, by Edward C. Jones..... 333
Effects of Temperature on the Limits of Explosions of Combustible Gas Mixtures..... 601
Egner, Mr., Resigns His Position..... 773
Electric Arc, The..... 406
Electric Generators, Commercial Rating of, by Thos. G. Grier. 187
Electric Lamps, Patched..... 893
Electric Lighting Progress in London, by Mr. F. Bailey.....5, 45
Electric Station of the Clinton (Mass.) Company..... 85
Electrical Energy, Distribution of..... 637
Electrical Engineer, Observations of a Constructing.....
Electrical Units of the Present and Future, by Prof. F. B. Crocker.....80, 112
Electricity and Gas..... 154
Electricity, Hydrogen and Oxygen Produced by..... 495
Electricity, Present Theories Concerning the Nature of, by Prof. C. S. Cook.....888, 921
Enfield, William, Presidential Address Southwestern Gas Association..... 148
Enfield, William, Gas as a Source of Light, Heat and Power.. 151
English Correspondence, Special.....153, 298, 442, 602, 782, 923
Equity Company, Brooklyn, to Go Ahead..... 157
Estimating the Value of Purifying Materials..... 299
Experience in Purification, An, by Mr. T. A. Bates..... 600
Experience in Purification, Correction..... 674

EDITORIALS—

The Old Year and the New..... 1
Mr. Bailey's Eccentric Comment..... 37
Annual Meeting of the Southwestern Gas Association.... 73
Obituary—William Mooney..... 146
Annual Meeting, New England Association..... 182
This Week at Boston..... 218
The Meeting of the Ohio Association..... 219
What Level Management Will Achieve..... 219
Obituary—William H. Down..... 253
President Prichard's Address..... 290
Mr. Lamson's Estimate of the Value of Note-Books..... 326
The Situation at Rochester..... 397
Afterthoughts Tracing to the Zanesville Meeting..... 433
Gas Works Residuals..... 469
Gas Commissioners and Their Powers..... 469
The Louisville Meeting..... 521
The World's Fair and the Gas Interest..... 521
Society of Gas Lighting..... 521
The Fuel Gas Scheme at Milwaukee..... 557
The Columbia Land Company..... 557
Secretary Littleton's Second Notice..... 593
Annual Meeting, American Meter Company..... 593
Director Windrim and the Stokers of the Ninth Ward Works..... 593
Rumor and Fact vs. the Western Gas Association..... 666
Cleveland City Council Demonstrates its Incapacity..... 702
Decision in the Chelsea Case..... 702
Mr. Egner Resigns His Position..... 773
The Louisville Meeting..... 773
The Blundering at St. Louis..... 809
Report of the World's Fair Committee, Western Association..... 809
Professor Bemis on the Gas Supply of Nashville, Tenn.... 881

## F

*Fenny's Patent Pipe-Cutting Machine..... 185
Few Notes on Carbureted Water Gas at Beckton, by T. Goulden..... 857
Fire Resisting Construction..... 151
Foote, Allan R., Municipal Ownership of Industries..... 40
Foote, A. R., Municipal Ownership of Quasi-Public Works. 668, 707
Foundations for Heavy Buildings..... 188
Fourth Annual Meeting Southwestern Gas Association. Official Report.....558, 594
Fourteenth Annual Meeting Western Gas Association. Official Report.....738, 774, 811, 847, 882

# INDEX TO VOL. LIV.


Freezing Machines Shown at Paris Exhibition..... 150
French Commission on Gas Manufacture..... 189
Friction and Lubrication of Journals..... 13
Fuel Gas Company's Capital, Grand Rapids, Mich..... 47

## C

*Gas Analysis Apparatus, Aldeny's..... 219
Gas and Electricity..... 154
Gas as a Source of Light, Heat and Power, by Mr. William Enfield..... 151
Gas vs. Coal in Pittsburgh..... 7
Gas Consumption, Heavy, in Philadelphia..... 11
*Gas Engine, Atkinson Cycle..... 818
Gas Engineers, Chemical Studies for, by Norton H. Humphrys.....39, 75, 147, 183
Gaseous Illuminants, by Prof. Vivian B. Lewes..... 3, 42, 76, 113
Gas for Cooking and Lighting Purposes, Separately Measuring Through One Meter and Service..... 603
Gas Governor, Automatic..... 677
Gas Lighting in Suburban Districts..... 82
Gas Lighting, by Mr. M. S. Greenough..... 111
Gas Manufacture, French Commission on..... 189
Gas Matters in Hamilton, Ohio, by James R. Smedberg....41, 83
Gas Meters, Some Thoughts on, by William Barratt..... 743
Gas Mixtures, Effects of Temperature on the Limits of Explosions of Combustible..... 601
Gas Motors, On..... 333
*Gas, Ramsdell's Apparatus for Manufacture of Wood and Oil..... 10
Gas Rate War..... 84
*Gas vs. Steam Power..... 671
Gas, Use of for Ventilation..... 918
Gates, Arthur R., Death of..... 191
Goulden, T., Few Notes on Carbureted Water Gas at Beckton..... 851
Grand Rapids, Mich., Dollar Gas at..... 48
Graves, Key City Gas Company's Contract with Mr..... 2
Greenough, Mr. M. S., Lighting by Gas..... 111
Grier, Thos. G., Commercial Rating of Electric Generators... 187
Grier, Thos. G., The Incandescent Lamp..... 694

## H

Hallett, James L., Coal Strikes and Petroleum Outlook..... 846
Hamilton, Ohio, Gas Matters in, by Mr. James R. Smedberg..... 41
Hardie, William, Owners of Gas Works vs. Tar and Ammoniacal Liquor Distillers..... 703
Harmony Club vs. New Orleans Gas Company..... 74
High Power Photometry with a Bunsen Photometer..... 260
Humphrys, Norton H., Chemical Studies for Gas Engineers.. 39, 75, 147, 183
Hunt, Charles, Purification, by..... 919
Hyde, Gustavus A., Jr., Obituary Note..... 881
Hydraulic Cements..... 818
Hydrogen and Oxygen Produced by Electricity..... 495

## I

Illuminants, Gaseous, by Prof. Vivian B. Lewes.....3, 42, 76, 113
*Illuminating Gas, Lindsay's Process for Manufacture of..... 886
Inaugural Address of President Paterson, Manchester Association..... 402
Incandescent Gas Lighting..... 367
Incandescent Gas Lighting, by W. MacKean, F. C. S..... 744
Incandescent Lamp, by Mr. Thomas G. Grier..... 694
Incandescent Lamps, Life of..... 851
Indiana Natural Gas Supply, Failing of..... 38
Indigo, Artificial Production of..... 83
Indoor Illumination, Problems Connected with..... 370
Industries, Municipal Ownership of, by Mr. Allan R. Foote.. 40
Iron Making, Natural Gas in..... 409
Items of Interest from Various Localities.....11, 47, 83, 119, 155, 191, 227, 263, 299, 335, 371, 407, 443, 495, 531, 567, 603, 639, 674, 711, 747, 783, 820, 855, 891, 925

## J

Jackson, Francis H., Death of.....326, 362
Jones, Edward C., Easy Method of Finding Units of Heat of Combustion, etc..... 333
*Jones Gas-Fired Boiler, The..... 369
Journals, Friction and Lubrication of..... 13

## K

Kentucky Gas Light Company..... 37
Key City Gas Company's Contract with Mr. Graves..... 2
Kingman, Kansas, Gas Company for..... 11
Kleeman's Gas and Smoke Helmet..... 749

## L

Laying Water Pipes Across Rivers..... 297
Lectures on Electricity, Columbia College..... 11
Lewes, Gaseous Illuminants, by Prof. Vivian B.....3, 42, 76, 113
Lewes, Two Interesting Papers, by Prof. Vivian B..... 631
Life of Incandescent Lamps..... 851
Light, Direct Production of..... 299
Light, Where Does it Go? by Col. A. J. Price..... 434
Lighting by Gas, by Mr. M. S. Greenough..... 111
Lighting, Electric, Progress in London, by Mr. F. Baily..... 5
*Lindsay's Process for the Manufacture of Illuminating Gas.. 886
Liverpool Lighting Now and in the Olden Time..... 890
London, Electric Lighting Progress in, by Mr. F. Baily.....5, 45
Loomis, Burdett, Explains Charters for Connecticut Towns... 119
Louisville, Ky., Gas Inspector's Annual Report..... 48
Louisville Meeting, The..... 773
Lubricators for Machinery, On..... 854
Lundie, Death of William B..... 37

## M

MacKean, W., F. C. S., Incandescent Gas Lighting..... 744
Manchester Association, Inaugural Address by President Paterson..... 402
*Manufacture of Wood and Oil Gas, Ramsdell's Apparatus for..... 10
Manufacture of Oxygen from Air..... 118
Market for Gas Securities.....2, 38, 86, 110, 157, 194, 230, 265, 302, 337, 373, 398, 434, 470, 522, 558, 606, 642, 677, 713, 738, 785, 810, 857, 893, 927
Massachusetts Gas, Quality and Power of..... 709
McDonald Bill, The Proposed, to Enable Cities and Towns of Massachusetts to Distribute Gas and Electricity..... 638
McGourkey, Death of Mr. William..... 74
Mechanical Engineer, The..... 119
Meter Company Annuals..... 74
*Meters for Measuring Natural Gas..... 111
Model Oil Gas Works..... 667
Mooney, William, Death of..... 110
Movement to Establish a Plan of Standard Castings..... 810
Municipal Ownership of Industries, by Mr. Allan R. Foote.... 40
Municipal Ownership of Quasi-Public Works, by Mr. Allan R. Foote.....668, 707

## N

Natural Asphalt and the Preservation of Iron and Steel Structures..... 706
Natural Gas, Amount Used in Iron, Glass and Brick Manufacture..... 81
Natural Gas Dutiable..... 48
Natural Gas in Iron-Making..... 409
Natural Gas, Meters for Measuring..... 111
Natural Gas, Pilot Tube Gauge for Measuring..... 220
New Albany Gas Company, New Works..... 119
New Aluminum Alloys..... 225
New Ammonia Plant for Coltness Iron Works..... 672
New England Association of Gas Engineers.....73, 109, 145, 181, 217, 260, 291, 328, 363, 399
New England Meeting, Editorial..... 254
Nitrogen, Utilization of Atmospheric..... 641
Notice from the Publishers..... 593

## O

Observations of a Constructing Engineer..... 9
Official Notices....73, 109, 145, 181, 217, 289, 290, 325, 361, 521, 557, 593, 629, 665, 701
Ohio Association, Special Editorial Correspondence..... 397
Ohio Gas Light Association.....218, 290, 325, 361
Ohio Gas Light Association, Seventh Annual Meeting, Revised Report.....435, 470, 522
Oil Gas Works, A Model..... 667
Otto, Dr. N. A., Obituary..... 266
Oxygen from Air, Manufacture of..... 118

## P

Patched Electric Lamps..... 893
Paternal Government and Our Industries, J. R. Thomas, C. E..... 255
Paterson, President, Inaugural Address, Manchester Association..... 402
*Pemberton, Jr., H., Apparatus for Heating Substances in Glass Tubes Under Pressure, by..... 710
Personal..... 737
Petroleum Market for 1890..... 117
Petroleum Wealth of Russia..... 405
Philadelphia Gas Works, Financial Statement..... 120
Photometry, High Power, with a Bunsen Photometer..... 260
*Pilot Tube Gauge for Measuring Natural Gas..... 220
*Pipe Cutting Machine, Fenny's Patent..... 185
Present Theories Concerning the Nature of Electricity, by Prof. C. S. Cook.....888, 921
Presidential Address, Annual Meeting (1890) Southwestern Gas Association, by William Enfield..... 148
Price, Col. A. J., Where Does Light Go?..... 434
Problems Connected with Indoor Illumination..... 370
Purification, by Charles Hunt..... 919
Purifying Materials, Estimating Value of..... 299

## Q

Quality and Power of Massachusetts Gas..... 709

## R

Radiant Matter..... 226
*Ramsdell's Apparatus for the Manufacture of Wood and Oil Gas..... 10
Ramsdell, Sr., Death of..... 191
Rebate to Large Consumers, Brattleboro, Vt..... 11
Reorganizations..... 37
Report of Inspector of Gas, Dominion of Canada..... 397
Rochester, N. Y., War of Rates..... 157
Russia, Petroleum Wealth of..... 405

## S

St. Joseph, Mo., Fuel Gas Company Trouble..... 48
St. Louis Methods..... 893
St. Louis, Output at..... 85
San Antonio Meeting, The..... 397
San Francisco Gas Rates..... 155
*Self-Sealing Retort Mouthpiece and Lid..... 890
Separately Measuring Gas for Cooking and Lighting Purposes Through One Meter and Service..... 603
Seventh Annual Meeting Ohio Gas Light Association, Revised Report.....435, 470, 522
*Simple Method for the Analysis of Coal or Coke..... 887
Smedberg, James R., Gas Matters in Hamilton, Ohio..... 41
Some Census Figures on the Coal Industry..... 297
Some of the Troubles with Steel Castings..... 781
Some Thoughts on Gas Meters, William Barratt..... 743
Something About Thermometers..... 373
Southwestern Association, Official Notice Annual Meeting.... 109, 145, 181, 217, 289
Southwestern Gas Association, Fourth Annual Meeting, Official Report.....558, 594
Special English Correspondence.....153, 298, 442, 602, 782, 923
Spencer (Mass.) Works Damaged by Fire..... 119
Standard Castings, Movement to Establish Plan of..... 810
Starr, Edwin M., Death of..... 666
Steel Castings, Some of the Troubles with..... 781
Steel Pipes..... 890
Sulphate Market..... 154

## T

Terrace, David, on District Pressure..... 703
Terre Haute, Ind., Gas Rate War..... 84
Tests, Cement, by Mr. T. H. Beare..... 8
Test Paper for Acids..... 49
Thermometers, Something About..... 373
Thomas, J. R., C. E., Paternal Government and Our Industries 255
Tufts Meter Firm to Continue..... 47
Two Interesting Papers, by Prof. Vivian B. Lewes..... 631
Two Papers Read Before the North of England Gas Manufacturer's Association..... 703

## U

Underground Electrical Work..... 22
Uninflammable Wood..... 47
Units, Electrical, of the Present and Future, by Prof. F. B. Crocker.....80, 112
Units of Heat of Combustion of Gaseous Mixtures, etc., by Edward C. Jones..... 333
Use of Asphaltum in Building Sea Walls, by C. W. Ambrose.. 924
Use of Gas for Ventilation..... 918
Utilization of Atmospheric Nitrogen..... 641
Utilization of Waste Carbonic Acid Gas..... 746

## V

Ventilation, Use of Gas for..... 918
Vincennes, Ind., Hints from..... 83

## W

*Wainwright, J. H., Ph. B., The Chapman Washing Bottle... 710
Warren, Pa., Candle Power of Arc Lights Tested at..... 156
Wedding Bells.....84, 120, 558
Western's Outing at Louisville, The..... 737
Western Gas Association, Official Notice Annual Meeting..... 521, 557, 593, 629, 665
Western Gas Association, Fourteenth Annual Meeting, Official Report.....738, 774, 811, 847, 882
Western Association, World's Fair Committee Report, Editorial 809
Wheat, Death of Mr. Corydon..... 11
Wheeling, W. Va., Electric Plant..... 83
Where Does Light Go? by Col. A. J. Price..... 434
Wood and Oil Gas, Ramsdell's Apparatus for Manufacture of.. 10
Wood, Uninflammable..... 47

## Z

Zanesville, This Week at..... 562

# INDEX TO VOL. LIV.

## SPECIAL INDEX OF REPORTS OF PROCEEDINGS OF ASSOCIATIONS.

### New England Association of Gas Engineers—Twenty-first Annual Meeting.


Address, President's ..... 241
Allyn, H. A., Different Methods and Devices for Accomplishing Similar Ends ..... 366
Applications for Membership ..... 260
Committee on Badges, Report of ..... 240
Committee on Nomination of Officers ..... 291
Committee on Preparing Statistics ..... 328
Committee on Visitors ..... 291
Different Methods and Devices for Accomplishing Similar Ends, by H. A. Allyn ..... 366
Down, W. H., Tender of Sympathy to the Family of ..... 260
Elected to Honorary Membership ..... 291
Election of New Members ..... 260
Election of Officers ..... 328
Gerould, L. P., Unaccounted-for Gas in Coal Gas Works; the Cause, Remedy and Results ..... 327
Gifford, N. W., Trouble in Purifying Gas from Sulphurous Coals ..... 293
Goodno, George F., Some Experiments on the Rate of Purification ..... 291
Honorary Membership, Elected to ..... 291
In Memoriam—General Charles Roome, J. Henri Rollins, Nathaniel Tufts ..... 401, 402
Lamson, C. D., Note-Books; Their Value and How to Keep Them ..... 328
Memorial Committee ..... 328
Nominating Committee, Report of ..... 328
Note-Books, Their Value and How to Keep Them, by C. D. Lamson ..... 328
Officers, Election of ..... 328
Page, Mr. G. Shepard, on Residuals ..... 363
President's Address ..... 261
Purification, Some Experiments on the Rate of, by George F. Goodno ..... 291

QUESTION-BOX:

How Much Can Leakage be Safely Reduced by Governors? 365
How Much Trouble is Experienced from Deposits of Pitch or Hard Substances in Water Gas Works or Mains? ... 399
Is a Gas Company Legally Liable for Damage to Trees Caused by Leakage of Gas? ..... 366
Is Any Foreign Pitch or Tar Coming to the Market at the Present Time? ..... 399
What Are the Advantages of the Cartridge Method of Applying Enrichers? ..... 364
What Burner is Best Suited to Use for a Mixture of Coal and Water Gas by General Consumers? ..... 400
What Experience Have Members Had with the Welsbach Burner? ..... 399
What is the Best Way to Sell Incandescent Light; by Meter or by Guessing? ..... 400
What is the Smallest Size Cast Iron Pipe That it is Policy to Lay? ..... 365
What is the State of the Ammonia Market To-day, and Are There Prospects of a Better Price? ..... 399
Won't Water Gas Give More Candle Power in a Flat-flame Burner? ..... 400

Reading the Papers ..... 291
Repairing Holder Tanks, by F. C. Sherman ..... 331
Report of Committee on President's Address ..... 328
Report of Nominating Committee ..... 328
Report of Treasurer ..... 291
Residuals, Mr. G. Shepard Page on ..... 363
Roll Call ..... 295
Rollins, J. Henri, In Memoriam ..... 402
Roome, General Charles, In Memoriam ..... 402
Sherman, F. C., Repairing Holder Tanks ..... 331
Some Experiments on the Rate of Purification, by George F. Goodno ..... 291
Statistics, Committee on Preparing ..... 328
Sulphurous Coals, Trouble in Purifying Gas from, by N. W. Gifford ..... 293
Tender of Sympathy to the Family of the Late W. H. Down ..... 260
Treasurer, Report of ..... 291
Trouble in Purifying Gas from Sulphurous Coals, by N. W. Gifford ..... 293
Tufts, Nathaniel, In Memoriam ..... 402
Two Invitations ..... 291
Unaccounted-for Gas in Coal Gas Works; the Cause, Remedy and Results, by L. P. Gerould ..... 327
Vote of Thanks ..... 401


### Ohio Gas Light Association—Seventh Annual Meeting.


Address, President's ..... 436
Adjourned ..... 531
Alleged Prejudice Against Gas Companies, and How Best to Eradicate It, by Eugene Printz ..... 479
Butterworth, Irvin, Does Ohio Want a Gas Commission? ..... 472
Christian, George H., Present Outlook for Manufactured Fuel Gas ..... 523
Committee on President's Address ..... 437
Consideration of the Arguments For and Against Water Gas, by Frederick H. Shelton ..... 483
Delegate to the World's Fair ..... 522
Desirability of a Uniform System of Gas Companies' Accounts, by A. P. Lathrop ..... 481
Does Ohio Want a Gas Commission? by Irvin Butterworth ... 472
Douglas, W. H., The Proper Handling of Oxide of Iron in Purification ..... 437
Election of New Members ..... 435
Election of Officers ..... 526
Executive Committee, Report of ..... 435
How a Small Works Can Profitably Utilize its Ammoniacal Liquor, by George Osius ..... 470
In What Direction Shall Ohio Gas Companies Look for the Cheapening of Their Product? by H. Wilkiemeyer ..... 492
Joint Committee on Uniformity in Gas Accounts ..... 483
Letters of Regret ..... 437
Lathrop, A. P., Desirability of a Uniform System of Gas Companies' Accounts ..... 481
Osius, George, How a Small Works Can Profitably Utilize its Ammoniacal Liquor ..... 470
Present Outlook for Manufactured Fuel Gas, by George H. Christian ..... 523
President's Address ..... 436
Printz, Eugene, Alleged Prejudice Against Gas Companies, and How Best to Eradicate It ..... 479
Proper Handling of Oxide of Iron in Purification, by W. H. Douglas ..... 437

QUESTION-BOX:

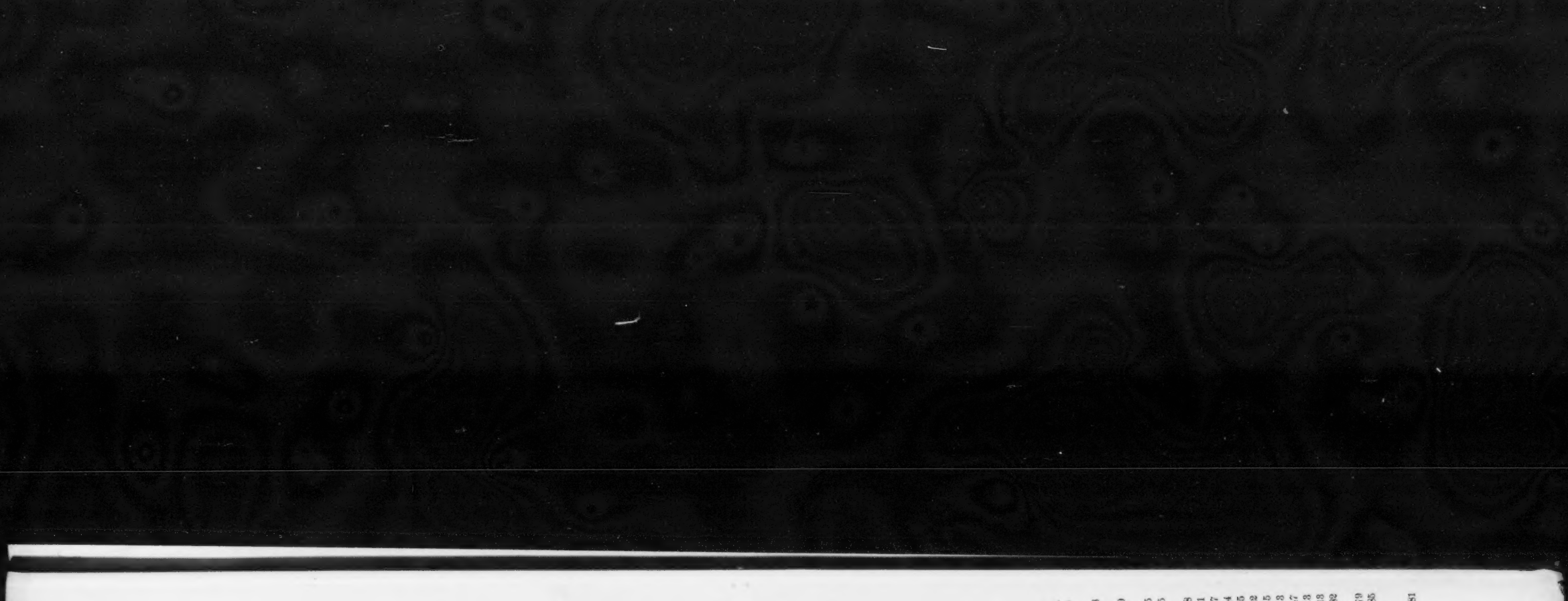
Given a Town of 10,000 Population, Out-put of Gas 8,000,000, 20 Meters, 5 Miles of Mains, Selling Coal Gas at $2 per 1,000 net, Cost of Coal $3.25, with Street Lighting Done by a Municipal Plant: Can an Electric Plant be Operated Successfully in Opposition, Using Steam Power? ..... 527
Has Illuminating Gas Been Improved and Cheapened During the Past Three Years as Much as the Incandescent Electric Light? ..... 528
How Can Retorts be Prevented from Getting Coated with Carbon? ..... 441
Is There Any Steam Heating Apparatus in Which Illuminating Gas Can Be Used for Fuel at Not Too Great a Cost, When Gas is Figured at Cost in the Holders? ..... 529
Suppose the Normal Pressure, etc. A Problem in Pressure Conditions ..... 527
What Are the Causes of the Lowering of the Candle Power of Gas? ..... 530
What is the Average Per Cent. of Sulphur in Lima Crude Oil? ..... 530
What is the Best Material for Roof of Retort House? ..... 530
What is the Best Method of Burning Carbon from Retorts? ..... 441, 528
What is the Best Method of Repairing Leaky Gasholder Tanks? ..... 528
What is the Best Paint for Lids of Purifying Boxes? ..... 440
What is the Cause of Lava Tips Fouling When the Gas Shows Clean by the Usual Test? ..... 531
What is the Igniting Temperature of Common Coal Gas? ..... 529
What is the Least Grade per 100 Lineal Feet Practicable to Drain Gas Mains? ..... 529
What Should be a Fair Allowance For Shrinkage in Both Coal Gas and Carbureted Water Gas? ..... 441
When a Mixture of Coal Gas and Air is Exploded, How Much Does the Volume of Resultant Gases Exceed That of the Original Mixture? ..... 529
Which is the Better Method of Condensation, Open Air or Water? ..... 440
Would it be Economy for a Gas Company with Only 1,500 Consumers to Do its Own Meter Repairing? .... 529

Report of Committe on Nominations ..... 522
Report of Committee on Place of Meeting ..... 482
Report of Committee on President's Address ..... 482
Report of the Executive Committee ..... 435
Reports of the Secretary and Treasurer ..... 435
Roll Call ..... 436
Secretary and Treasurer, Reports of ..... 435
Shelton, Frederick H., Consideration of the Arguments For and Against Water Gas ..... 483
Special Committees ..... 481
Vote of Thanks ..... 531
Water Gas, Arguments For and Against, Frederick H. Shelton 483
What Burner, if Any, is Better Than the Lava Tip for Use With Water Gas of 22 to 25 Candle Power? ..... 491
Wilkiemeyer, H., In What Direction Shall Ohio Gas Companies Look for the Future Cheapening of Their Product? 493


### Southwestern Gas Association—Fourth Annual Meeting.


Address, President's ..... 558
Adjournment ..... 600
Advantages of a Gas Engineer Being a Member of a Gas Association, by A. E. Judge ..... 559
Applications for Membership ..... 558
Commercial Possibilities of Gas, by Thos. D. Miller ..... 596
Committees Appointed ..... 559
Cullinane, J. R., The Hydraulic Main ..... 564
Election of Officers ..... 559
Enfield, Wm., Gas Coals of the Southwest ..... 561
Gas Coals of the Southwest, by Wm. Enfield ..... 561
Hydraulic Main, by J. R. Cullinane ..... 566
Inspecting the Missions ..... 560
Judge, A. E., Advantages of a Gas Engineer Being a Member of a Gas Association ..... 559
Leakage and Condensation, by H. P. Russell ..... 564
Miller, Thos. D., Commercial Possibilities of Gas, by ..... 596
Question Box ..... 599
Report of Committee on Obituary ..... 559
Report of Committee on Place of Next Meeting ..... 559
Regenerative Benches in the Southwest, by E. A. West ..... 594
Reports of Secretary and Treasurer ..... 559
Roll Call ..... 558
Russell, H. P., Leakage and Condensation ..... 564
West, E. A., Regenerative Benches in the Southwest ..... 594


### Western Gas Association—Fourteenth Annual Meeting.


Address, President's ..... 738
Adjourned ..... 886
Adjusting the Annual Dues ..... 885
Annex to a Small Gas Plant; What it Should Be, by William Tracy ..... 779
Barker, Commissioner, Electing to Honorary Membership ..... 885
Committees, Announcement of ..... 774
Committee of Arrangements, Invitation by ..... 774
Committee on President's Address ..... 774
Copy of Form Submitted ..... 882
Does it Pay to Use Inclined Retorts in Small Gas Works? by John Gimper ..... 777
Dunbar, J. W., on the Practical Efficiency of a Semi-Regenerative Furnace ..... 775
Economic Results of an Electric Light Investment, from the Standpoint of a Gas Man Who Never Invested in an Electric Light Plant, by Sylvester Watts ..... 781
Electing Commissioner Barker to Honorary Membership ..... 885
Election of New Members ..... 814
Election of Officers ..... 847
Gas Engines: Some Practical Results and Comparisons, by E. H. Jenkins ..... 811
Gimper, John, Does it Pay to Use Inclined Retorts in Small Gas Works? ..... 777
Jenkins, E. H., Gas Engines: Some Practical Results and Comparisons ..... 811
Letters of Regret ..... 851
Lindsley, Edward, Municipal Control as an Economic Factor. 850
*Mitchell, K. M., Removal of Ammonia from Illuminating Gas, and the Best Method of its Accomplishment ..... 848
Municipal Control as an Economic Factor, by Edward Lindsley ..... 850
On the Practical Efficiency of a Semi-Regenerative Furnace, J. W. Dunbar ..... 775
Reading of Papers ..... 775
*Removal of Ammonia from Illuminating Gas, and the Best Method of its Accomplishment, by K. M. Mitchell ..... 848
Report of Committee on Memorials ..... 851
Report of Committee on Place of Meeting ..... 847
Report of Committee on President's Address ..... 814
Report of Committee on Recognition of Hospitalities ..... 885
Report of Committee on Uniformity of Gas Accounts ..... 882
Report of Committee on World's Fair ..... 815
Report of Finance Committee ..... 813
Report of Nominating Committee ..... 847
Report of Secretary and Treasurer ..... 813
Roll Call ..... 813
Slater, Mr. A. B., Copy of Form Submitted by ..... 882
Tracy, William, What an Annex to a Small Gas Plant Should Be ..... 779
Vote of Thanks ..... 885
Watts, Sylvester, Economic Results of an Electric Light Investment, from the Standpoint of a Gas Man Who Never Invested in an Electric Light Plant ..... 781